CLAIMS

1.   A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, the power detector/controller comprising:

a power amplifier having an input to receive a input signal with non-constant amplitude envelope and an output to output an amplified input signal, wherein either output power or gain of the power amplifier is controlled by a power amplifier control signal;

an output demodulating detector coupled to the output of the power amplifier to generate a feedback signal proportional to the amplified input signal's power, the feedback signal including an AM variation due to the non-constant amplitude envelope;

a summing junction to receive the feedback signal, a ramp control signal that indicates either a target gain or target output power of the power amplifier, and an AM variation signal that represents the AM variation in the power of the input signal due to the non-constant amplitude envelope; and

the summing junction combining the feedback signal, the ramp control signal and AM variation signal to produce the power amplifier control signal such that the power amplifier control signal substantially free of any AM variation due to the non-constant envelope.

2.   A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 1, further comprising:

3   an input demodulating detector coupled to the input of the power amplifier to

4   generate the AM variation signal received by the summing junction.

1   3.   A power detector/controller for wireless handsets that use a modulation scheme having

2   a non-constant amplitude envelope, as per claim 2, wherein the input demodulating detector is

3   coupled to the input via a phase shifter.

1   4.   A power detector/controller for wireless handsets that use a modulation scheme having

2   a non-constant amplitude envelope, as per claim 2, wherein the summing junction comprises:

3   a variable gain amplifier operatively coupled to the input demodulating detector

4   to receive the AM variation signal and adjust the amplitude of the AM variation signal;

5   a differential amplifier to receive the feedback signal on a negative input and to

6   receive the ramp control signal on a positive input, the differential amplifier having a

7   filter capacitor connected between the negative input and an output of the differential

8   amplifier, the differential amplifier producing an error signal from the feedback signal

9   and ramp control signal; and

10   a sum node to receive the AM variation signal from the variable gain amplifier

11   and to receive the error signal, the sum node combining the received AM variation

12   signal and error signal to produce the power amplifier control signal that is substantially

13   free of any AM variation due to the non-constant envelope.

1   5.   A power detector/controller for wireless handsets that use a modulation scheme having

2   a non-constant amplitude envelope, as per claim 4, wherein the variable gain amplifier is

3   operatively coupled to the input demodulating detector via an ac-coupling capacitor that

4   removes any DC component in the AM variation signal.

1   6.   A power detector/controller for wireless handsets that use a modulation scheme having

2   a non-constant amplitude envelope, as per claim 2, wherein the summing junction comprises:

3   a variable gain amplifier operatively coupled to the input demodulating detector

4   to receive the AM variation signal and adjust the amplitude of the AM variation signal;

5   a multiplication node to multiply the AM variation signal from the variable gain

6   amplifier with the ramp control signal to produce a composite AM variation/ramp

7   control signal; and

8   a differential amplifier to receive the feedback signal on a negative input and to

9   receive the composite signal on a positive input, the differential amplifier having a filter

10   capacitor connected between the negative input and an output of the differential

11   amplifier, the differential amplifier producing the power amplifier control signal that is

12   substantially free of any AM variation due to the non-constant envelope from the

13   composite signal and ramp control signal.

1   7.   A power detector/controller for wireless handsets that use a modulation scheme

2   having a non-constant amplitude envelope, as per claim 6, wherein the variable gain

3   amplifier is operatively coupled to the input demodulating detector via an ac-

4   coupling capacitor that removes any DC component in the AM variation signal.

1   8. A power detector/controller for wireless handsets that use a modulation scheme having

2   a non-constant amplitude envelope, as per claim 2, wherein the input and output

3   demodulating detectors are logarithmic detectors and the summing junction comprises:

4   a sum node operatively coupled to the input demodulating detector to add the

5   AM variation signal with the ramp control signal to produce a composite AM

6   variation/ramp control signal; and

7   a differential amplifier to receive the feedback signal on a negative input and to

8   receive the composite signal on a positive input, the differential amplifier having a filter

9   capacitor connected between the negative input and an output of the differential

10   amplifier, the differential amplifier producing the power amplifier control signal that is

11   substantially free of any AM variation due to the non-constant envelope from the

12   composite signal and ramp control signal.

1 9.   A power detector/controller for wireless handsets that use a modulation scheme having

2 a non-constant amplitude envelope, as per claim 8, wherein the sum node is operatively

3 coupled to the input demodulating detector via an ac-coupling capacitor that removes any DC

4 component in the AM variation signal.

1   10.   A power detector/controller for wireless handsets that use a modulation scheme having

2   a non-constant amplitude envelope, as per claim 2, wherein the input and output demodulating

3   detectors are logarithmic detectors and the summing junction comprises:

4   a low pass filter to filter the feedback signal;

5   an operational amplifier to receive the filtered feedback signal on a negative

6   input and to receive the ramp control signal on a positive input, the differential

7   amplifier producing a gain error signal from the filtered feedback signal and ramp

8   control signal;

9   a sum node to combine the AM variation signal, the feedback signal from the

10   output demodulating detector, and the gain error signal to produce a combined signal

11   substantially free of any AM variation due to the non-constant envelope; and

12   an error amplifier/integrator to receive the combined signal and produce the

13   power amplifier control signal substantially free of any AM variation due to the non-

14   constant envelope from the composite signal and ramp control signal.

1   11.   A power detector/controller for wireless handsets that use a modulation scheme having

2   a non-constant amplitude envelope, as per claim 1, wherein the wireless handsets also use a

3   modulation scheme having a constant amplitude envelope.

1   12.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, the wireless handset comprising:

3   a power detector/controller to control the power level of output RF bursts, the

4   power detector/controller comprising:

5   a power amplifier having an input to receive a input signal with non-

6   constant amplitude envelope and an output to output an amplified input signal,

7   wherein either output power or gain of the power amplifier is controlled by a

8   power amplifier control signal;

9   an output demodulating detector coupled to the output of the power

10   amplifier to generate a feedback signal proportional to the amplified input

11   signal's power, the feedback signal including an AM variation due to the non-

12   constant amplitude envelope;

13   a summing junction to receive the feedback signal, a ramp control signal

14   that indicates either a target gain or target output power of the power amplifier,

15   and an AM variation signal that represents the AM variation in the power of the

16   input signal due to the non-constant amplitude envelope; and

17   the summing junction combining the feedback signal, the ramp control

18   signal and AM variation signal to produce the power amplifier control signal

19   such that the power amplifier control signal substantially free of any AM

20   variation due to the non-constant envelope.

1   13.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 12, further comprising:

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3   an input demodulating detector coupled to the input of the power amplifier to

4   generate the AM variation signal received by the summing junction.

1   14.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 13, wherein the input demodulating

3   detector is coupled to the input via a phase shifter.

1   15.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 13, wherein the summing junction

3   comprises:

4   a variable gain amplifier operatively coupled to the input demodulating detector

5   to receive the AM variation signal and adjust the amplitude of the AM variation signal;

6   a differential amplifier to receive the feedback signal on a negative input and to

7   receive the ramp control signal on a positive input, the differential amplifier having a

8   filter capacitor connected between the negative input and an output of the differential

9   amplifier, the differential amplifier producing an error signal from the feedback signal

10   and ramp control signal; and

11   a sum node to receive the AM variation signal from the variable gain amplifier

12   and to receive the error signal, the sum node combining the received AM variation

13   signal and error signal to produce the power amplifier control signal that is substantially

14   free of any AM variation due to the non-constant envelope.

1   16.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 15, wherein the variable gain amplifier

3   is operatively coupled to the input demodulating detector via an ac-coupling capacitor that

4   removes any DC component in the AM variation signal.

1   17.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 13, wherein the summing junction

3   comprises:

4   a variable gain amplifier operatively coupled to the input demodulating detector

5   to receive the AM variation signal and adjust the amplitude of the AM variation signal;

6   a multiplication node to multiply the AM variation signal from the variable gain

7   amplifier with the ramp control signal to produce a composite AM variation/ramp

8   control signal; and

9   a differential amplifier to receive the feedback signal on a negative input and to

10   receive the composite signal on a positive input, the differential amplifier having a filter

11   capacitor connected between the negative input and an output of the differential

12   amplifier, the differential amplifier producing the power amplifier control signal that is

13   substantially free of any AM variation due to the non-constant envelope from the

14   composite signal and ramp control signal.

1   18.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 17, wherein the variable gain amplifier

3   is operatively coupled to the input demodulating detector via an ac-coupling capacitor that

4   removes any DC component in the AM variation signal.

1   19.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 13, wherein the input and output

3   demodulating detectors are logarithmic detectors and the summing junction comprises:

4   a sum node operatively coupled to the input demodulating detector to add the

5   AM variation signal with the ramp control signal to produce a composite AM

6   variation/ramp control signal; and

7   a differential amplifier to receive the feedback signal on a negative input and to

8   receive the composite signal on a positive input, the differential amplifier having a filter

9   capacitor connected between the negative input and an output of the differential

10   amplifier, the differential amplifier producing the power amplifier control signal that is

11   substantially free of any AM variation due to the non-constant envelope from the

12   composite signal and ramp control signal.

1   20.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 19, wherein the sum node is

3   operatively coupled to the input demodulating detector via an ac-coupling capacitor that

4   removes any DC component in the AM variation signal.

1   21.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 13, wherein the input and output

3   demodulating detectors are logarithmic detectors and the summing junction comprises:

4   a low pass filter to filter the feedback signal;

5   a differential amplifier to receive the filtered feedback signal on a negative input

6   and to receive the ramp control signal on a positive input, the differential amplifier

7   producing a gain error signal from the filtered feedback signal and ramp control signal;

8   a sum node to combine the AM variation signal, the feedback signal from the

9   output demodulating detector, and the gain error signal to produce a combined signal

10   substantially free of any AM variation due to the non-constant envelope; and

11   an error amplifier/integrator to receive the combined signal and produce the

12   power amplifier control signal substantially free of any AM variation due to the non-

13   constant envelope from the composite signal and ramp control signal.

1   22.   A wireless handset for a mobile communication system that uses a modulation scheme

2   having a non-constant amplitude envelope, as per claim 12, wherein a modulation scheme

3   having a constant amplitude envelope is also used.

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1　23.　An RF power amplifier module for signals having a modulation scheme with a non-

2　constant amplitude envelope, the RF power amplifier module comprising:

3　　　　a power amplifier having an input to receive a input signal with non-constant

4　amplitude envelope and an output to output an amplified input signal, wherein either

5　output power or gain of the power amplifier is controlled by a power amplifier control

6　signal;

7　　　　an output demodulating detector coupled to the output of the power amplifier to

8　generate a feedback signal proportional to the amplified input signal's power, the

9　feedback signal including an AM variation due to the non-constant amplitude envelope;

10　　　　a summing junction to receive the feedback signal, a ramp control signal that

11　indicates either a target gain or target output power of the power amplifier, and an AM

12　variation signal that represents the AM variation in the power of the input signal due to

13　the non-constant amplitude envelope; and

14　　　　the summing junction combining the feedback signal, the ramp control signal

15　and AM variation signal to produce the power amplifier control signal such that the

16　power amplifier control signal substantially free of any AM variation due to the non-

17　constant envelope.

1　24.　An RF power amplifier module for signals having a modulation scheme with a non-

2　constant amplitude envelope, as per claim 23, further comprising:

3   an input demodulating detector coupled to the input of the power amplifier to

4   generate the AM variation signal received by the summing junction.

1   25.   An RF power amplifier module for signals having a modulation scheme with a non-

2 constant amplitude envelope, as per claim 24, wherein the input demodulating detector is

3 coupled to the input via a phase shifter.

1   26.   An RF power amplifier module for signals having a modulation scheme with a non-

2 constant amplitude envelope, as per claim 24, wherein the summing junction comprises:

             a variable gain amplifier operatively coupled to the input demodulating detector

4   to receive the AM variation signal and adjust the amplitude of the AM variation signal;

5   a differential amplifier to receive the feedback signal on a negative input and to

6   receive the ramp control signal on a positive input, the differential amplifier having a

7   filter capacitor connected between the negative input and an output of the differential

8   amplifier, the differential amplifier producing an error signal from the feedback signal

9   and ramp control signal; and

10   a sum node to receive the AM variation signal from the variable gain amplifier

11   and to receive the error signal, the sum node combining the received AM variation

12   signal and error signal to produce the power amplifier control signal that is substantially

13   free of any AM variation due to the non-constant envelope.

1   27.   An RF power amplifier module for signals having a modulation scheme with a non-

2   constant amplitude envelope, as per claim 26, wherein the variable gain amplifier is

3   operatively coupled to the input demodulating detector via an ac-coupling capacitor

4   that removes any DC component in the AM variation signal.

1   28 .   An RF power amplifier module for signals having a modulation scheme with a non-

2   constant amplitude envelope, as per claim 24, wherein the summing junction comprises:

3   a variable gain amplifier operatively coupled to the input demodulating detector

4   to receive the AM variation signal and adjust the amplitude of the AM variation signal;

5   a multiplication node to multiply the AM variation signal from the variable gain

6   amplifier with the ramp control signal to produce a composite AM variation/ramp

7   control signal; and

8   a differential amplifier to receive the feedback signal on a negative input and to

9   receive the composite signal on a positive input, the differential amplifier having a filter

10   capacitor connected between the negative input and an output of the differential

11   amplifier, the differential amplifier producing the power amplifier control signal that is

12   substantially free of any AM variation due to the non-constant envelope from the

13   composite signal and ramp control signal.

1   29.   An RF power amplifier module for signals having a modulation scheme with a non-

2   constant amplitude envelope, as per claim 21, wherein the variable gain amplifier is

3   operatively coupled to the input demodulating detector via an ac-coupling capacitor that

4   removes any DC component in the AM variation signal.

1   30.   An RF power amplifier module for signals having a modulation scheme with a non-

2   constant amplitude envelope, as per claim 24, wherein the input and output demodulating

3   detectors are logarithmic detectors and the summing junction comprises:

4   a sum node operatively coupled to the input demodulating detector to add the

5   AM variation signal with the ramp control signal to produce a composite AM

6   variation/ramp control signal; and

7   a differential amplifier to receive the feedback signal on a negative input and to

8   receive the composite signal on a positive input, the differential amplifier having a filter

9   capacitor connected between the negative input and an output of the differential

10   amplifier, the differential amplifier producing the power amplifier control signal that is

11   substantially free of any AM variation due to the non-constant envelope from the

12   composite signal and ramp control signal.

1   31.   An RF power amplifier module for signals having a modulation scheme with a non-

2   constant amplitude envelope, as per claim 19, wherein the sum node is operatively coupled to

3   the input demodulating detector via an ac-coupling capacitor that removes any DC component

4   in the AM variation signal.

1   32.   An RF power amplifier module for signals having a modulation scheme with a non-

2   constant amplitude envelope, as per claim 24, wherein the input and output demodulating

3   detectors are logarithmic detectors and the summing junction comprises:

4   a low pass filter to filter the feedback signal;

5   a differential amplifier to receive the filtered feedback signal on a negative input

6   and to receive the ramp control signal on a positive input, the differential amplifier

7   producing a gain error signal from the filtered feedback signal and ramp control signal;

8   a sum node to combine the AM variation signal, the feedback signal from the

9   output demodulating detector, and the gain error signal to produce a combined signal

10   substantially free of any AM variation due to the non-constant envelope; and

11   an error amplifier/integrator to receive the combined signal and produce the

12   power amplifier control signal substantially free of any AM variation due to the non-

13   constant envelope from the composite signal and ramp control signal.33. An RF power

14   amplifier module for signals having a modulation scheme with a non-constant amplitude

15   envelope, as per claim 23, wherein a modulation scheme having a constant amplitude

16   envelope is also used.